TITLE OF THE INVENTION

METHOD, SYSTEM AND COMPUTER PROGRAM PRODUCT FOR COPING WITH THE CHANGES IN HARDWARE

BACKGROUND OF THE INVENTION

5   1.   Field of the Invention

The present invention relates to a method, system and computer program product coping with a change in hardware utilizing remote maintenance management.

2.   Description of the Related Art

10   To improve the efficiency of maintenance services, a remote maintenance system has been constructed, in which a user product and a server of a maintenance center are connected via a network and the product is subjected to suitable maintenance by remote control

15   from the maintenance center.

In such a system, a user product to be subjected to maintenance, incorporating a communication device such as a modem, is connected to a server of a maintenance center through a network, for example, the

20   Internet or a private line. With use of this maintenance system, trouble in software of the user product can be eliminated and software can be upgraded by remote control from the server of the maintenance center.

25   However, if trouble occurs in hardware of the product, it is necessary for a serviceman to check the product, and replace parts or adjust the hardware. If

trouble occurs in a product and it results from a
particular part, similar trouble may occur in another
user's product which is the same type. In this case,
the part of the other user's product must also be

5   replaced. Even if trouble does not occur in a product,
the particular part may have to be changed in order to
improve the quality of the product.

Conventionally, if it is necessary to replace a
part as mentioned above, the maintenance center sends

10   instructions for replacement of the part to servicemen.
Each serviceman must confirm the types of the user's
products that he takes charge of, and judge whether
they require replacement of parts. Further, after he
judges whether replacement of parts is required, he

15   must calculate the number of required replacement
parts, and request the maintenance center to supply the
required number of parts. The maintenance center must
order the parts after receipt of the request of
replacement parts from the serviceman. Therefore, it

20   is difficult to grasp the required number of parts and
send scheduled orders for replacement parts immediately
after the necessity for part replacement is recognized.

Thus, there is a need for a method and system,
which specify a user's product that requires part

25   change, and notify a serviceman of the part change by
using a network or a remote maintenance system.

There is also a need for a method and system,

which calculates the number of parts that require change and orders replacement parts.

BRIEF SUMMARY OF THE INVENTION

According to an aspect of the present invention, a method coping a change in hardware accesses a product of a user through a network and acquires information on the product of the user, acquires information on a part to be changed, and generates information on a product that requires change of a part from the information on the product of the user and information on the part to be changed.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

The accompanying drawings, which are incorporated in and comprise a part of the specification, illustrate presently embodiments of the invention, and together with the general description given above and detailed description of the embodiments given below, serve to explain the principles of the invention.

FIG. 1 is a block diagram for explaining the overall structure of a system according to a first embodiment of the present invention;

FIG. 2 is a structural diagram of a server used in the embodiment;

FIG. 3 is a flowchart showing an operation of coping with a change in hardware in the first embodiment; and

FIG. 4 is a flowchart showing an operation of

coping a change in hardware in a second embodiment.

DETAILED DESCRIPTION OF THE INVENTION

Embodiments of the present invention will now be
described with reference to the drawings.

5   FIG. 1 is a block diagram for explaining the
overall structure of a system according to a first
embodiment of the present invention. A server 11 of a
maintenance center, which exercises control over
product maintenance, is connected to each product 12

10   used by users via a network 13. The network 13 may be
a private line managed by the maintenance center and
only used by subscribed users. Alternatively, it may
be a line that can be used by anybody, such as the
Internet.

15   FIG. 2 is a structural diagram of a server 11 used
in the embodiment. The server 11 comprises a CPU 21, a
memory 22, an input device 23, a network interface 24,
an output device 25, an intracompany LAN interface 26
and a system bus 27.

20   The memory 22 is a flash memory including a flash
memory card drive, a hard disk including a hard disk
drive, a ROM, a RAM, or the like. The input device 23
is a keyboard, a mouse, or the like. The network
interface 24 is connected to the network server 13,

25   such as the Internet or the private line, i.e., a
communication path to the outside of the server 11.
The output device 25 is a display or the like. The

intracompany LAN interface 26 is connected to another
system or a printer in the maintenance center which
uses the server 11, or an external system which uses
information collected by the server 11. These are

5   connected to one another by the system bus 27.

(First Embodiment)

FIG. 3 is a flowchart showing an operation of
coping a change in hardware in the first embodiment.
It is premised that the product of the user

10 incorporates a communication device such as a modem,
and is connected to the server 11 of the maintenance
center via the network 13, such as the Internet or a
private line.

In a step S11, the server 11 accesses the product

15 12 of the user from the network interface 24 through
the network 13, and acquires information on the product
of the user. The acquisition of the product informa-
tion is periodically performed. And the server 11 may
access the product 12 of the user and acquire product

20 information by necessity. The acquired product
information is stored in the memory 11.

The product information includes a product
manufacture number, information on an option
configuration, network configuration information, usage

25 condition information, software information, etc. It
is possible to know the model or version of the product
from the product manufacture number. The information

on an option configuration is information representing
what peripheral equipment is used. The network
configuration information is information representing
what configuration the network has. The usage

5   condition information includes the number of times of
use, the degree of concentration of use, etc., and
represents what condition the model is used in. If the
product is an image forming apparatus, the usage
condition information includes count data of printing

10   and copying. The software information represents
information on the software of the product. It
includes version information or the like of the
software. If the product is an image forming
apparatus, the software information includes version

15   information or the like of the printer driver. When
the software is changed, the version of the software
may be incompatible with a part of the user's product.
In this case, it is necessary to not only upgrade the
software but also change the part in use. The product

20   information may include user information, such as the
address of the user who uses the product, service
information on, for example, the service center and
serviceman that take charge of the user.

In a step S12, the server 11 acquires hardware

25   change information, i.e., information on a part to be
changed. The information includes information on the
part to be changed and information of the model to be

changed in which the part is incorporated. The
information may be acquired by input through the input
device 23 of the server 11, or externally acquired
through the intracompany LAN interface 26 as data from
the outside of the server 11. When the maintenance
center or the design department determines that a
specific part of a specific model is required,
information on the part to be changed is input to the
server 11. The information on the part to be changed
may include solution information. The solution
information is information informing what solution
should be taken when trouble occurs in the hardware of
the product. In this embodiment, the solution
information includes the nature of trouble, the object
model, the version of the model, the part to be
changed, etc.

The step 11 and the step 12 may be performed in
the reverse order. In this case, the server 11 will
acquire the information on the product of the user,
after acquiring the information on the part to be
changed.

In a step S13, the CPU 21 of the server 11 reads
the information on the product of the user from the
memory 22, performs matching with the information on
the part to be changed acquired in the step S12, and
generates information on the product that requires
change of the part. The information may further

include information on the part that needs to be changed, user information and service information.

In a step S14, the information generated in the step 13 is notified to the service center or the equipment owned by the serviceman, i.e., the person in charge of the service. The information may be notified as data to the equipment owned by the person in charge of the service through the intracompany LAN interface 26 of the server 11, or output to the output device 25 of the server 11. Alternatively, it may be output to another printer. In addition to the information generated in the step 13, the solution information may be notified to the equipment owned by the person in charge of the service.

(Second Embodiment)

This embodiment is a modification of the first embodiment. FIG. 4 is a flowchart showing an operation of coping a change in hardware of this embodiment. The same symbols as those used in FIG. 3 are assigned to the portions in common with the first embodiment. Detailed descriptions of the step S11 to the step S13, which are in common with the first embodiment, will be omitted.

In a step S24, the total number of parts that need to be changed is calculated from the information on the product that requires change of parts.

In a step S25, order data on the parts to be

changed is generated from the calculated numbers of the parts that need to be changed. The order data includes the part name and the part number that specify the part, and the number of each part required. The order data serves as basic data for a written order.

In a step S26, the generated order data is transmitted to a service parts system. The order data may be transmitted to a parts department or a parts maker. Alternatively, the generated order data may be output to the printer so that it can be transmitted to the parts department.

FIGS. 3 and 4 are flowchart illustrations of the method and the system according to the embodiments of the invention. Each block of the flowchart and combinations of blocks in the flowchart can be implemented by computer program instructions. These computer program instructions may be loaded onto a computer or other programmable apparatus to produce a machine, such that the instructions which execute on the computer or other programmable apparatus create means for implementing the functions specified in the flowchart block or blocks. These computer program instructions may also be stored in a computer-readable memory that can direct a computer or other programmable apparatus to function in a particular manner, such that the instructions stored in the computer-readable memory produce an article of manufacture including instruction

means which implement the function specified in the flowchart block or blocks. The computer program instructions may also be loaded onto a computer or other programmable apparatus to cause a series of

5 operational steps to be performed on the computer or other programmable apparatus to produce a computer implemented process such that the instructions which execute on the computer or other programmable apparatus provide steps for implementing the function specified

10 in the flowchart block or blocks.

An optical disk such as a CD-ROM, a magneto-optical disk such as an MO, or a semiconductor memory may be a concrete example of the computer-readable memory.

15 Additional advantages and modifications will readily occur to those skilled in the art. Therefore, the invention in its broader aspects is not limited to the specific details and representative embodiments shown and described herein. Accordingly, various

20 modifications may be made without departing from the spirit or scope of the general inventive concept as defined by the appended claims and their equivalents.